PROCEEDINGS OF THE

ENTOMOLOGICAL SOCIETY OF WASHINGTON

VOL. 45 NOVEMBER, 1943 No. 8

PAUROPODA FROM THE DUKE FOREST

By J. H. STARLING,

Duke University, Durham, North Carolina

The writer collected organisms, periodically during the year 1941–42, from soil of the Duke Forest, with the aid of modified Berlese funnels. Such collections included 5 and possibly 6 species of pauropods which form the basis for this paper.

Pauropoda constitute a class of progoneate (Pocock 1893) and labiate (Snodgrass 1938) arthropods. They are distinguished from other "myriapods" by the presence of branched antennae, 11 post-cephalic somites, and 9 pairs of ambulatory legs in the adult, except those in the genus *Decapauropus* which have 12 trunk somites and 10 pairs of ambulatory legs.

Sir John Lubbock (1866) was the first to call attention to these remarkable animals and described 2 species from England. Packard (1870) extended the geographical range to North America when he "insufficiently" (Hansen 1902) described a species from Salem, Massachusetts. (Ryder (1879) proposed a new family and a new genus and described *Eurypauropus spinosus* from Fairmont Park, Philadelphia. Latzel (1880, 1884) divided the group into 2 families and added 4 species from Austria, one being the type for his new genus *Brachypauropus*. Tömösváry (1884) in Russia, Daday (1889) in Hungary, Silvestri (1895) in Italy, and Attems (1895) in Austria, all described species. Haase (1885) from Schleswig and Berlese from Italy redescribed Lubbock's species. Both Schmidt (1895) and Kenyon (1895) published anatomical and morphological papers. Cook (1895) "insufficiently" (Hansen, 1902) described several species from Indiana and Long Island. Two of his three proposed genera were accepted: *Stylopauropus* by Hansen (1902) and *Allopauropus* by Verhoeff (1934). The most outstanding work on the systematics of Pauropoda was that of Hansen (1902). In it he included characteristics of families and genera, along with the description and geographical distribution of 22 new European and South American species. In the same year Silvestri erected *Allopauropus*, *Hemipauropus*, and *Scleropauropus* for his new Italian species. Bagnall (1909, 1911, 1914, 1918) gave an account of the British Pauropoda. Harrison (1914) described a new species of *Eurypauropus* and

4 of *Pauropus* from New South Wales. Hilton (1928, 1930, 1930a, 1930b, 1931, 1931a, 1931b, 1933, 1934) published papers on American species found in Alaska, California, Oregon, Iowa, and New Mexico. Williams and Hefner (1928) reported *Eurypauropus spinosus* and *Pauropus huxleyi* from Ohio. Remy has done more with the group than any other since Hansen. His more important contributions included descriptions of: A new family (Polypauropodidae, 1932), 3 new genera (*Decapauropus*, 1931; *Polypauropus*, 1932; and *Gravieripus*, 1937b); at least 36 new European species (1930, 1931, 1933, 1933a, 1935, 1935a, 1935b, 1935c, 1935d, 1935e, 1936, 1936a, 1936b, 1936c, 1937, 1937a, 1937b, 1937c, 1938, 1940); 5 new variations (1932, 1935e); and an extension of Eurypauropodidae. Kishida (1928) proposed *Neopauropus* and Esaki (1934) *Thaumotopauropus* for their Japanese species. Other important publications are those of Attems (1930) and Verhoeff (1934). Verhoeff (1934) and Bagnall (1935) have extended the classification to show more clearly the relationship of the families and to take into account the newly described species.

The present paper embodies: (1) the description of 4 new species of pauropods from the Duke Forest; and (2) a checklist of species as reported from various parts of the world. The Duke Forest collection includes: *Brachypauropus pearsei* n. sp.; *Eurypauropus spinosus* Ryder, 1879; *Pauropus carolinensis* n. sp.; *Pauropus dukensis* n. sp.; *Pauropus causeyae* n. sp.; and a species of *Stylopauropus* for which I shall not propose a name since the single specimen is damaged to such an extent as to preclude a complete description.

As well as the writer is able to determine, there is no previous reference as to the occurrence of pauropods in the South-eastern United States, nor is there a report of the occurrence heretofore of a representative of *Brachypauropus* in North America.

Grateful acknowledgment is made to Dr. A. S. Pearse, who was very helpful to the writer during this study.

DESCRIPTION OF NEW SPECIES

Brachypauropus pearsei, new species

Material. Four immature (? sex) specimens. Color: White. Dimensions: Length of body, 0.52 mm.; greatest width of body, 0.19 mm.; greatest width of head, 0.07 mm.; median length of head, 0.05 mm.

Head. The head has 3 transverse rows of dorsal, curved, and pointed setae. The first row has 4, the two outer appearing somewhat shorter than the two median setae. The second and third row each have 6 setae, 4 median and 2 lateral. The eye areas are visible from the ventral view and are relatively small.

Antenna (fig. 1A). The peduncle consists of 3 segments. The upper branch is a little over twice as long as broad, and slightly longer than the two distal joints of the peduncle. The lower branch is as long as the upper branch. The

width of the anterior margin of the former is at least twice as wide as that of the latter. The anterior flagellum is slightly shorter than the flagellum of the upper branch. The posterior flagellum is even shorter than the anterior one. The unringed basal portion of the longest flagellum is slightly longer than the

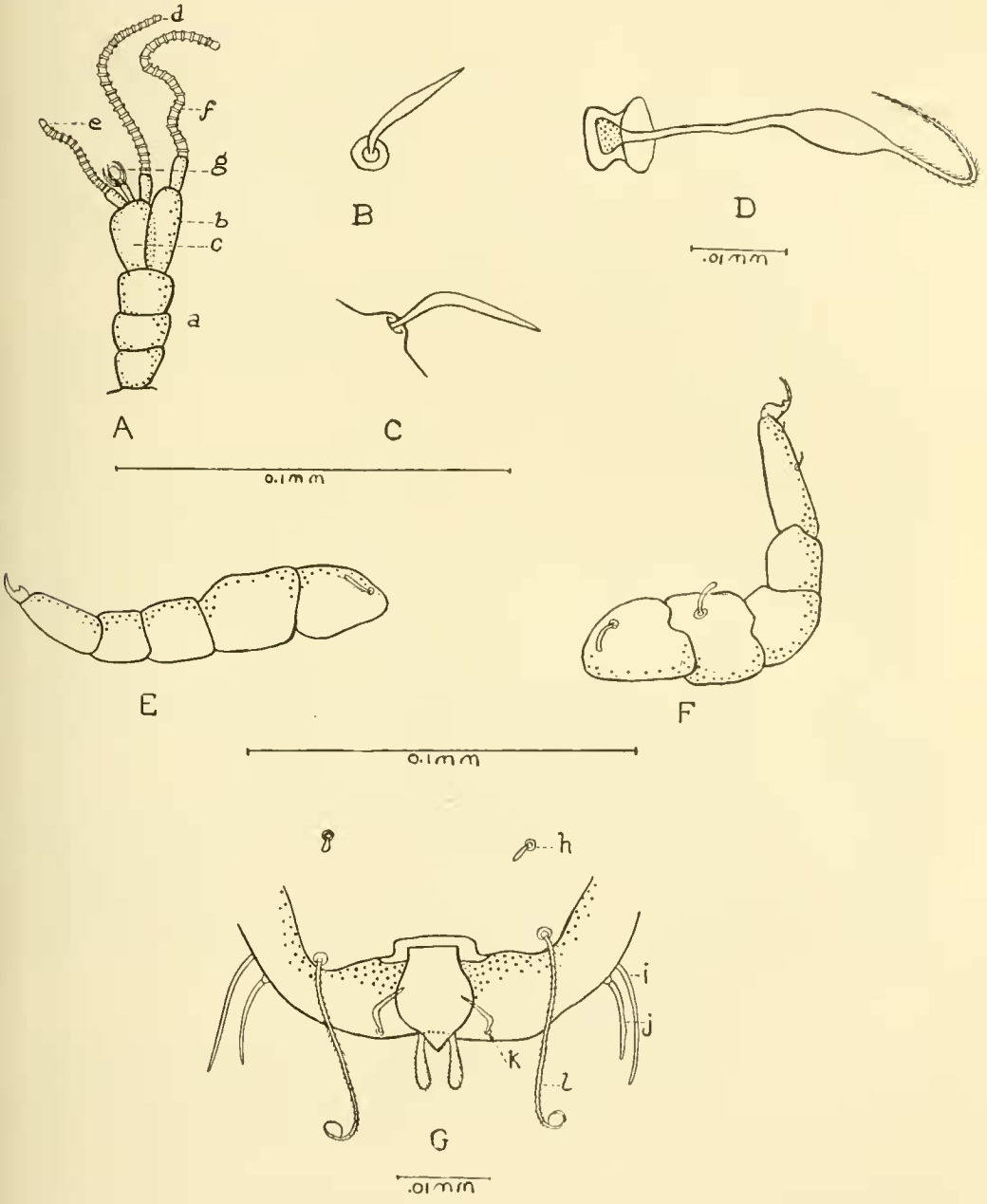

Fig. 1.—*Brachypauropus pearsei* n. sp. A. left antenna seen from above; B. dorsal seta; C. lateral seta; D. right third sensory seta; E. ventral view of the left leg of first pair, from specimen with six pairs of legs; F. ventral view of right leg of sixth pair; G. ventral view on anal region. a. peduncle; b. upper branch; c. lower branch; d. anterior flagellum; e. posterior flagellum; f. flagellum of upper branch; g. globulus; h. anterior seta on sternum of the anal segment; i. intermediate seta on the tergum; j. lateral seta on the tergum; k. stilus; l. posterior seta on the sternum of the anal segment.

breadth of the posterior margin of the lower branch and longer than the same part of the other two flagella. The globulus is nearly spherical and its stalk is slightly longer than its transverse diameter.

Trunk. The third instar seems to possess 5 terga; each except the last is subdivided into 2 pairs of highly chitinized and subequal plates. The setae of each tergite are arranged in 2 transverse rows on these plates; each row has 4 setae, exclusive of the lateral setae, except the first row of the first tergite which has 2 setae. The setae are curved and pointed (figs. 1B, 1C). The last tergite possesses only one highly chitinized plate with 2 pairs of setae; those of the more anterior pair are closer together. There are 4 pairs of tactile setae; the first pair is slightly longer than the second and the third, but approximately equal to the length of the fourth. The third pair is peculiar in that each has a hollow swelling, largest toward the middle of the seta; each is tapering and pubescent from this point distally (fig. 1D). The fourth pair of sensory setae are slender, tapering and more distinctly pubescent toward the distal third.

Legs. All the legs have 5 segments, and increase in length slightly from the anterior pair posteriorly. The segments of the last pair of legs are most robust, the trochanter is broader than long (figs. 1E, 1F).

Anal Segment (fig. 1G). On the tergum the submedian setae are very short and cylindrical and are situated near each other. The intermediate and lateral setae are approximately the same length, curved, tapering, and lie close together. On the sternum, the styli are curved, tapering, and are about half the length of the lateral setae. The posterior setae present a lyre effect with their distal ends rolled. The anterior setae are about one-sixth the length of the posterior setae.

Type.—Immature specimen with 6 pair of legs, collected from the Duke Forest under oak leaves, July 17, 1941, now in United States National Museum, No. 1433.

Remarks.—The distinctive features of this species are in the shape and size of styli, the single seta arrangement in each of the two first tergal plates, and the antennae. The anal region of *Brachypauropus pearsei* is similar to that of *B. superbus* Hansen, but differs in the character of the styli and the setae arrangement of the head.

Pauropus carolinensis, new species

Material. Four adult female specimens. Color: White. Dimensions: Length of body, 1.5 mm.; greatest width of body, 0.43 mm.; greatest width of head, 0.14 mm.

Head. The head has 4 transverse rows of dorsal, clavate, and pubescent setae. The first row contains 1 seta which projects forward; the second, 10, the two lateral setae on it are longer and smaller; the third, 5; and the last, 6. The eye areas are conspicuously large, as each occupies approximately three-fourths of the lateral edge of the head.

Antenna (fig. 2A). The length of the upper branch is greater than that of the lower branch and about equal to the combined length of the third and fourth segments of the peduncle. The width of the anterior margin of the lower

branch is greater than its posterior margin and wider than the greatest width of the upper branch. The inferior flagellum is about half as long as the superior one, which is approximately the same length as the flagellum of the upper branch. The globulus is small, nearly spherical and almost sessile. The longest setae on the dorsal surface of the fourth joint of the peduncle is nearly

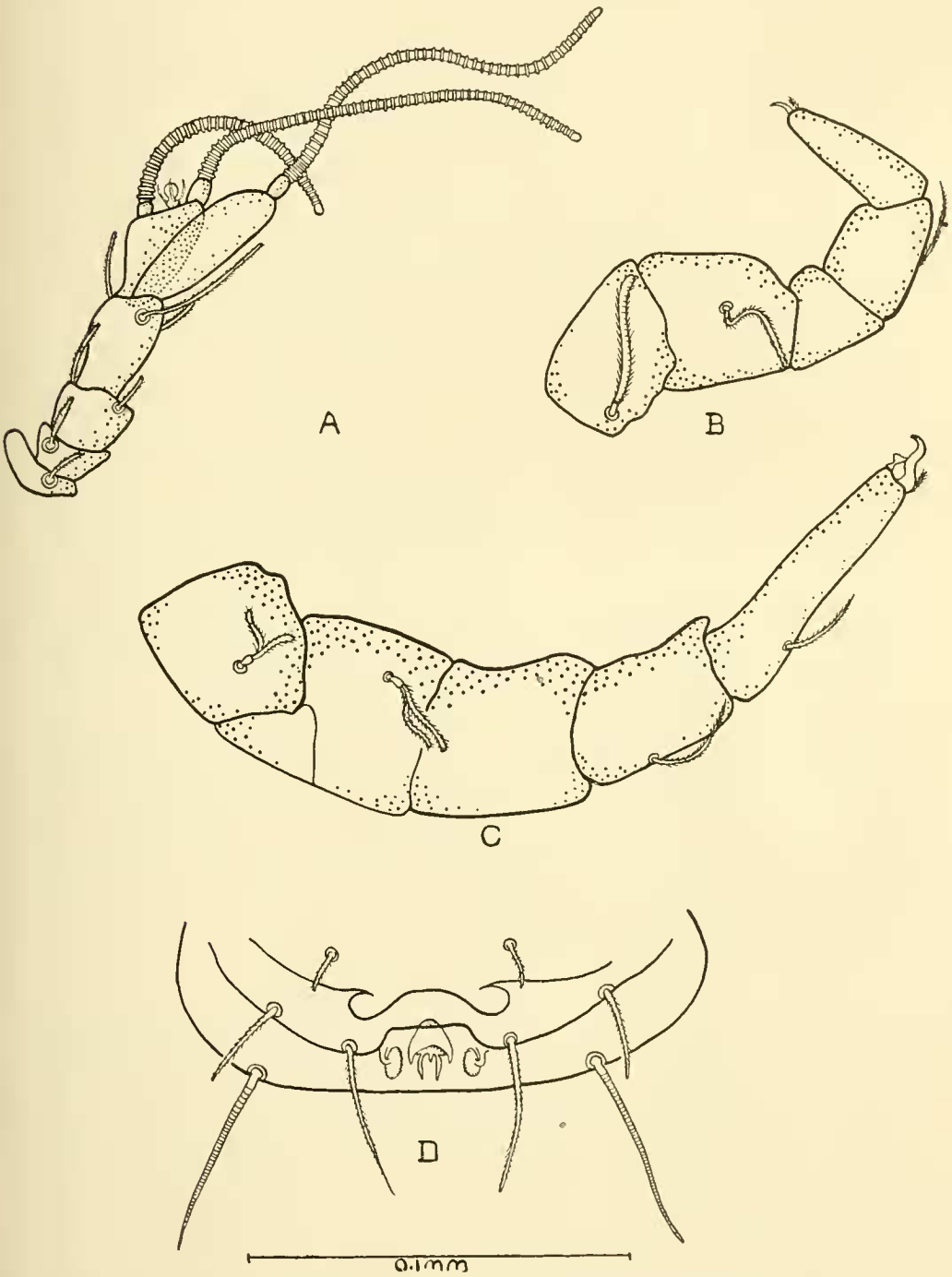

Fig. 2. *Pauropus carolinensis* n. sp. A. left antenna seen from above; B. ventral view of right leg of first pair of adult female; C. ventral view of right leg of ninth pair of adult female; D. ventral view of anal region.

as long as the upper branch. Each of the other segments of the peduncle bears 2 short setae.

Trunk. The trunk is robust. The first tergite has 2 rows of setae, similar in appearance to those of the head, with 4 in each row. The second tergite has 3 rows, 2 setae in the first, 6 in the second, and 4 in the third row. The third tergite has 2 rows with 4 and 6 setae, respectively in each row. The fourth tergite is similar to the third. The fifth bears 2 rows of setae, 6 in each row. The last tergite has 2 rows of 4 and 2 setae respectively. The tactile setae are all approximately the same length except the last pair which is longer. The pubescence of these sensory bristles is greatest towards their tapering apex.

Legs. The legs increase in length from the anterior pair posteriorly. Each leg of the first and the last pair has 5 segments. The coxa and trochanter of each of the first eight pairs of legs bear a simple, clavate, and pubescent seta (fig. 2B); while those of the last pair of legs are biramous (fig. 2C).

Anal Segment (fig. 2D). The submedian and intermediate setae of the tergum are approximately the same length, and each is about one half as long as the lateral setae. The setae are cylindrical, without pubescence, and tapering towards their distal ends. The styli are ovate and flat, as broad as long, and located on the ventral surface of the tergum, dorso-lateral to the anal plate. On the sternum, the anterior pair of setae are smaller in diameter and shorter in length than the posterior pair; both, however, are pubescent. The anal plate bears 2 sharp lateral spines between which are located 2 clavate, very slightly pubescent setae, and a small lobe between the setae.

Type.—An adult female, collected November 10, 1941, in the Duke Forest in oak and pine humus, now in the United States National Museum, No. 1434.

Remarks.—Instars with 3, 5, 6, 8 and 9 pairs of legs were collected from May–November, 1940 and 1941. Adults were collected throughout the year. The distinguishing characters are: Its size, the setae arrangement on the peduncle, and the anal region. The anal plate is similar to that of *Pauropus spinifer* Hansen, but the peculiar arrangement of the styli in *P. carolinensis* easily distinguishes it.

Pauropus causeyae, new species

Material. Three adult female specimens. Color: White. Dimensions. Length of body, 0.92 mm.; greatest width of body, 0.14 mm.; greatest length of head, 0.05 mm.; greatest width of head, 0.08 mm.

Head. The head bears 4 rows of clavate, pubescent setae. Progressing posteriorly each row consists of 4, 6, 4, and 9 setae, respectively. The ocular areas are large relative to the length of the head, and occupy about three-fifths of the lateral margins.

Antenna (fig. 3A). The two branches of the antenna are approximately the same length, the anterior margin of the lower branch being slightly wider than the same of the upper branch. The posterior flagellum of the globulus-bearing branch is about half the length of the anterior one. The latter is as long as the single flagellum. The unringed basal portion of the posterior and single

flagella are rather long, about one-third the length of their respective branches. The same region of the anterior flagellum is only slightly shorter. The fourth segment of the peduncle is larger than the third and bears 2 setae; the more anterior is longer than the upper branch. A single setae is located on the mid-dorsal surface of the lower branch.

Trunk. The body is slender. The first tergite bears 2 rows of clavate and pubescent setae, 4 to each row; the second, 3 rows with 2, 4, and 4 to each row respectively; the third, 4 rows with 2, 3, 2, and 4 setae; the fourth, 3 rows with 4, 2, and 4 setae; the fifth, 3 rows with 4 in each row; and the sixth, 2 rows of 2 and 4 setae.

Legs. The legs increase in length posteriorly. The first and ninth pairs are with 5 segments. The remainder of the legs have 6 segments. The coxa and trochanter of each leg bears a simple setae (figs. 3B, 3C). The tibia and tarsus of the last pair of legs each bear a seta, a short distance from their proximal ends. That of the tibia is as long as the joint; that of the tarsus is half its length.

Anal Segment (fig. 3D). The lateral setae of the sternum are about half the length of those in the posterior pair. No anterior setae were observed. The intermediate setae of the tergum appear to be about the same length as the

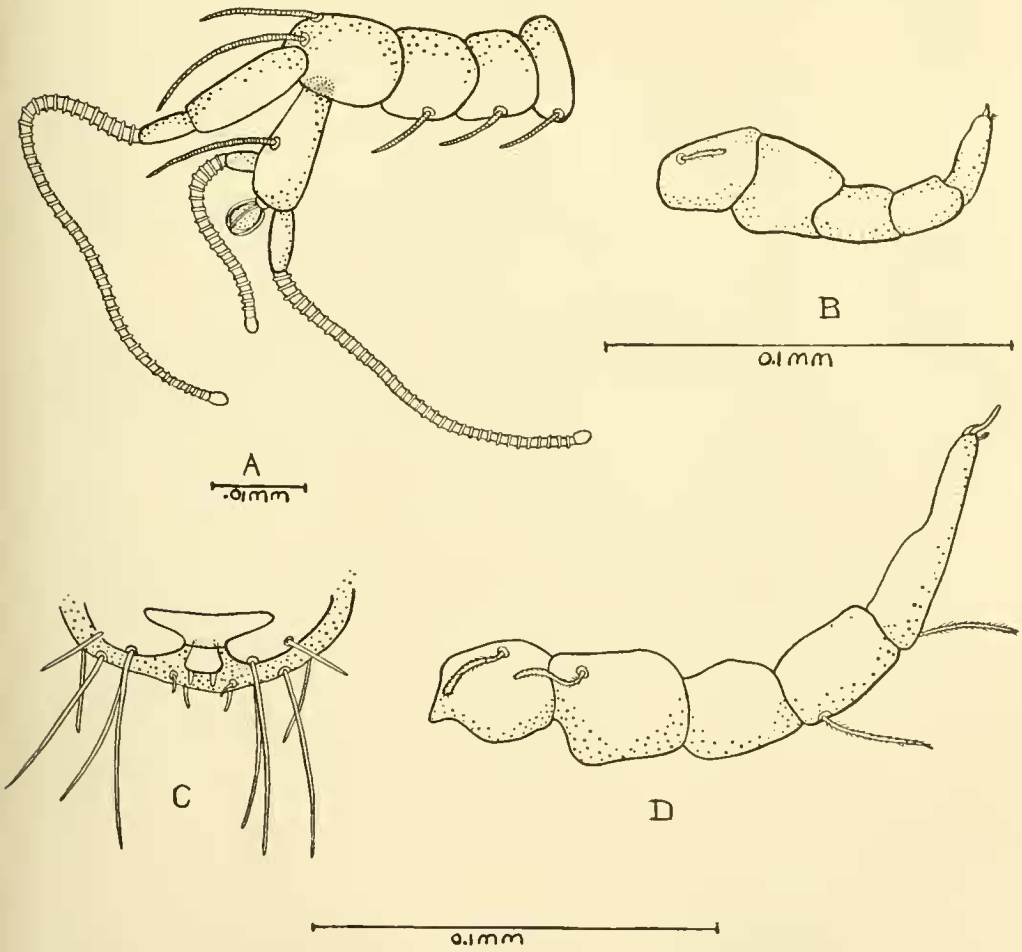

Fig. 3. *Pauropus causeyae* n. sp. A. left antenna seen from above; B. ventral view of right leg of first pair of adult female; C. ventral view of anal region; D. ventral view of right leg of ninth pair of adult female.

posterior setae of the sternum. The anal plate is truncate at its base and oval at its distal edge, with two lobes projecting from the same.

Type.—Adult female, collected August 3, 1941, from the Duke Forest in oak and pine humus, now in the United States National Museum, No. 1435.

Remarks.—The species is distinguished from others described by the long unringed portions of the flagella, the setae arrangement on the lower branch and the fourth segment of the peduncle, and the anal region. The anal plate of this species and that of *Pauropus argentinensis* are similar, but the proportion and shape of the antennal branches of *Pauropus causeyae* easily distinguishes it.

Pauropus dukensis, new species

Material. Three adult specimens, one female and two male. Color: White; Dimensions: Length of body, 0.88 mm.; greatest width of body, 0.18 mm. greatest length of head, 0.10 mm.; greatest width of head, 0.11 mm.

Head. The head bears 4 rows of dorsal, slightly clavate more nearly cylindrical, long, and finely pubescent setae, with 1, 5, 4, and 6 setae respectively in each row.

Antenna (fig. 4A). On the antenna the fourth segment of the peduncle bears two dorsal and tapering setae which are as long as the lower branch. The upper branch is longer than the last three segments of the peduncle and about one-fourth longer and half as wide as the lower branch. The unringed basal portions of the flagella supported by the lower branch are only slightly shorter than the similar structure supported by the upper branch. The globulus is spherical and nearly sessile, with a diameter of about the same length as the basal portion of the anterior and posterior flagella.

Trunk. The setae of each tergite are arranged near the edges. Tergite one bears 2 rows of 4 setae; tergite 2, 3 rows with 2, 5, and 4 setae respectively; tergite 3, 3 rows with 4, 2, and 4 setae; tergite 5, 4 rows with 2, 4, 2, and 4 setae; and the last tergite, 3 rows of 2 setae. The last two pair of sensory bristles are rather heavily pubescent. Paired penes in the male are as shown in figure 4E.

Legs. The legs are all rather long, but increase in length posteriorly; the last pair are about one and one-half times as long as the first pair. The coxa and trochanter of each leg bear a seta; those on the last pair are biramous. Leg pairs one and nine are without a metatarsus. A rather long seta extends from the tarsus of the ninth leg, a shorter one from the tibia (Fig. 4C).

Anal Segment (fig. 4D). The submedian setae of the tergum are slightly longer than the intermediate setae, and the latter longer than the lateral. On the sternum the anterior setae are absent. The styli are short and setiform. The anal plate is truncate at its base, with a somewhat hexagonal plate structure having an indention on its distal side. Two rather short setae leave the prongs of the notch.

Type.—An adult male collected from the Duke Forest in oak humus, July 12, 1941, now in United States National Museum, No. 1436.

Remarks.—Like *Pauropus inornatus*, *P. dukensis* has unusu-

ally long antennal branches, but it is easily distinguished by the shape of its anal plate and arrangement of setae on its anal segment.

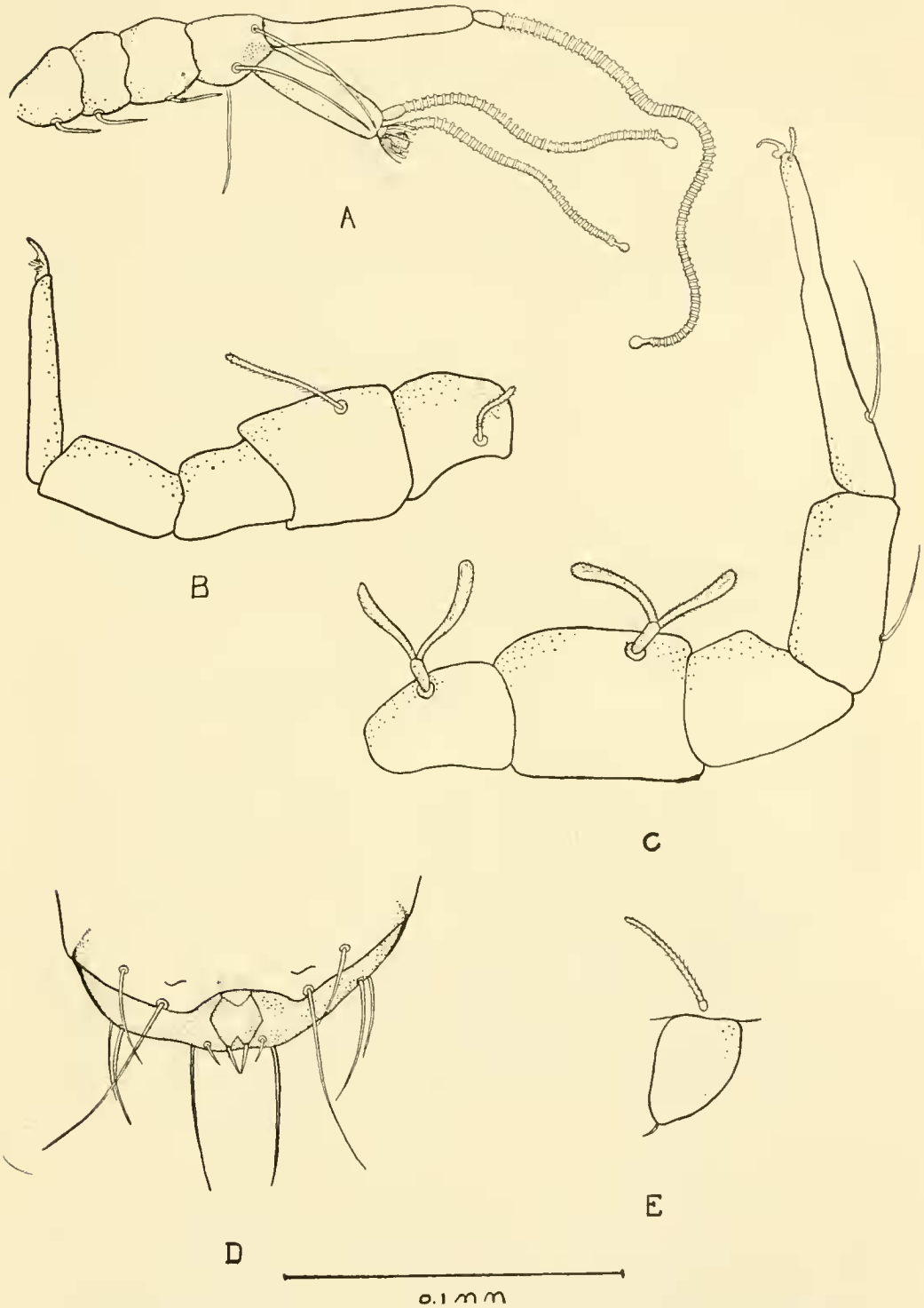

Fig. 4. *Pauropus dukensis* n. sp. A. right antenna seen from above; B. ventral view of left leg of first pair of adult male; C. ventral view of right leg of ninth pair of adult male; D. ventral view of anal region; E. left penis seen from the side.

Stylopauropus species

It is clear that a new species found in the Duke Forest belongs to the genus *Stylopauropus*, but insufficient material precludes a further description.

The stalk upon which the peduncle rests is greater than the diameter of the globulus itself (Fig. 5A). The setae on the coxa of the first and ninth pair of legs are peculiar and are shown in figures 5B 5C,.

LIST OF KNOWN PAUROPODA

The reported distribution of Pauropoda by countries is given in the following list. It is to be understood that the list is merely a compilation of the genera and species as they appear in the literature, and does not express opinions of the writer. Species which have been questioned as being valid are indicated in the following manner: a question mark before the name means that the whole reference is questionable; after the generic name, that the generic name is questionable; and after the species that the validity of the species has been questioned.

It appears that all the species of *Allopauropus* which were described before the genus was subdivided have not been reclassified relative to their respective subgenera.

Acopauropus ? Cook, 1896.

A. ornatus (Latzel, 1884). Cook, 1896—Austria, Germany.
Eurypauropus ornatus Latzel, 1884 (type).

Allopauropus ? Silvestri, 1902.

A. brevisetus Silvestri, 1902 (?type)—Italy.
A. barcinonensis Remy, 1933—France, Spain.
A. brolemanni Remy, 1935d—France.
A. corsicus Remy, 1940—France.
A. decaryi Remy, 1937—Madagascar.
A. gravieri Remy, 1935d—France.
A. hessei Remy, 1935c—France.
A. jeanneli Remy, 1935b—East Africa.
A. minutus Silvestri, 1902—Italy.
A. productus Silvestri, 1902—France, Greece, Italy.
A. ribauti Remy, 1937—Dalmatia.

Allopauropus (Allopauropus) Remy, 1936.

A. (*A.*) *aristatus* Remy, 1936c—France.
A. (*A.*) *danicus* (Hansen, 1902). Remy, 1936—Denmark, England, France, Greece, Great Britain, Italy.
Pauropus danicus Hansen, 1902.
A. danicus var. *rectistylus* Remy, 1938—Rumania.
A. (*A.*) *denisi* Remy, 1936b—France.

A. (*A.*) *distinctus* Remy, 1936 (Bagnall in litt.)—Germany, Great Britain.
A. (*A.*) *doryphorous* Remy, 1936b—Greece.
A. (*A.*) *furcula* Silvestri, 1902. Remy, 1936—Greece, Italy.
A. furcula Silvestri, 1902.
A. (*A.*) *fuscinifer* Remy, 1936b—Rumania.
A. (*A.*) *gracilis* (Hansen, 1902). Remy, 1936—Denmark, England, France, Germany, Greece, Italy.
Pauropus gracilis Hansen, 1902.
A. (*A.*) *helveticus* (Hansen, 1902). Remy, 1936—France.
Pauropus helveticus Hansen, 1902.
A. (*A.*) *helveticus* var. *obtusicornis* Remy, 1935e—France.

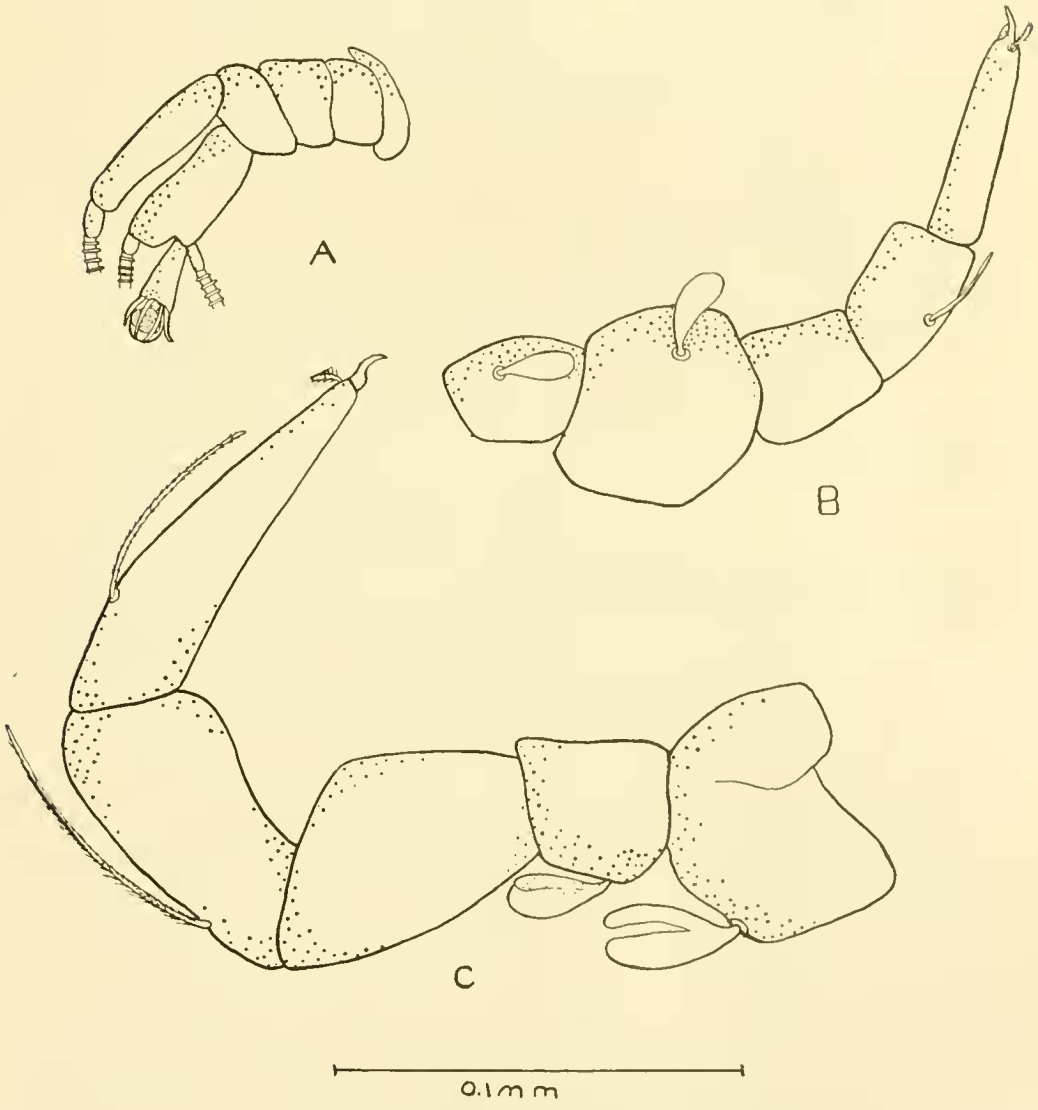

Fig. 5. *Stylopauropus* sp. A. left antenna seen from above; B. ventral view of right leg of first pair from adult female; C. side view of left leg of ninth pair from adult female.

A. (*A.*) *multiplex* Remy, 1936—Germany.
A. (*A.*) *sceptrifer* Remy, 1936b—France.
A. (*A.*) *subminutus* Remy, 1936b—France.
A. (*A.*) *thallossophilus* Remy, 1935a—France.
A. (*A.*) *vulgaris* (Hansen, 1902). Remy, 1936—Denmark, England, France, Germany, Greece, Italy, Jugoslavia.
Pauropus vulgaris Hansen, 1902.
A. (*A.*) *zerlingae* Remy, 1936a—France.

Allopauropus (Decapauropus) Remy, 1936.

A. (*D.*) *cuenoti* (Remy, 1931). Remy, 1937c—France.
Decapauropus cuenoti Remy, 1931 (type).
A. (*D.*) *amaudruti* Remy, 1936—Germany.
A. amaudruti var. *cordieri* Remy, 1938—Yugoslavia.
A. (*D.*) *helophorus* Remy, 1936b—Rumania.
A. (*D.*) *sabaudianus* Remy, 1936—France, Jugoslavia, Great Britain.
Decapauropus sabaudianus Remy, 1935.

Allopauropus (Thalassopauropus) Remy, 1936b.

A. (*T.*) *remyi* (Bagnall, 1935a). Remy, 1936b—England.
Thalassopauropus remyi Bagnall, 1935a.

Asphaeridiopus Bagnall, 1935.

A. ashrowthi Bagnall, 1935 (type)—Scotland.

Australopauropus Bagnall, 1935.

A. speciosus (Harrison, 1914) Bagnall, 1935—New South Wales.
Eurypauropus speciosus Harrison, 1914 (type).

Brachypauropus Latzel, 1884.

B. hamiger Latzel, 1884 (type)—Austria-Hungary.
B. lubbocki Bagnall, 1914—England.
B. superbus Hansen, 1902—Italy.
B. tuberosus Remy, 1936—Germany.

Eurypauropus Ryder, 1879.

E. spinosus Ryder, 1879a, b (type)—Indiana, Massachusetts, New York, Ohio, Pennsylvania.
E. consobrinus Remy, 1937b—France.
E. hastatus Attems, 1895—Austria.
E. okinoshimensis Esaki, 1934—Japan.

Gravieripus Remy, 1937b.

G. latzeli (Cook, 1896). Remy, 1937a—Austria, Germany, Italy.
Eurypauropus spinosus Latzel, 1884 (non *E. spinosus* Ryder) (type).
E. latzeli Cook, 1896.
E. hansenii Silvestri, 1902.
E. latzeli Hansen, 1902.
E. (*E.*) *latzelli* Verhoeff, 1934.

Hemipauropus Silvestri, 1902.

H. leptoproctus Berlese, 1902 (type)—Italy.

Neopauropus Kishida, 1928.

N. niwai Kishida, 1928 (type)—Japan.

Pauropus Lubbock, 1866.

P. huxleyi Lubbock, 1866 (type)—Austria, California, Denmark, England, France, Germany, Italy. Massachusetts, Pennsylvania, Russia.
? *P. lubbockii* Packard, 1870. Latzel, 1883.
P. huxleyi var. *filiformis* ? Latzel, 1884—Austria.
P. huxleyi var. *lanceolatus* Remy, 1937—Finland.
P. amicus Harrison, 1914—New South Wales.
P. arctus Hilton, 1931a—Alaska.
P. argentinensis Hansen, 1902—Argentina.
P. armatus Hansen, 1902—Siam.
P. australis Harrison, 1914—New South Wales.
P. bagnalli Remy, 1935e—France.
P. bollmani ? Cook, 1896—Indiana.
P. burrowesi Harrison, 1914—New South Wales.
P. californianus Hilton, 1930a—California.
P. caudaspinosus Hilton, 1930a—New York.
P. claviger Hansen, 1902—Siam.
P. dawydoffi Remy, 1933a—Indo-China.
P. elegantulus Hansen, 1902—Siam.
P. filiformis ? Cook, 1896—Austria.
P. furcifer Silvestri, 1902—France, Great Britain, Italy, Jugoslavia, Rumania.
P. globus Hilton, 1930a—California.
P. impar ? Cook, 1896—Long Island.
P. indigenous Hilton, 1930a—California.
P. inornatus Hansen, 1902—Paraguay.
P. intermedius Hansen, 1902—Chile.
P. laminus Hilton, 1930—California.
P. manus Hilton, 1933—New Mexico.
P. medianus Hilton, 1934a—Iowa.

P. medius Hilton, 1930a—California.
P. mexicanus Hilton, 1930a—Mexico.
P. modestus Hansen, 1902—Siam.
P. mortensenii Hansen, 1902—Siam.
P. nexus Hilton, 1933—New Mexico.
P. novaehollandiae Harrison, 1914—New South Wales.
P. oculatus Hansen, 1902—Siam.
P. pectinatus Hansen, 1902—Italy.
P. pinus Hilton, 1930a—California.
P. pygmaeus Hansen, 1902—Argentina.
P. quercus Hilton, 1930a—California.
P. robustus Hansen, 1902—Chile.
P. santus Hilton, 1930a—California.
P. siamensis Hansen, 1902—Siam.
P. simulans Hansen, 1902—Siam.
P. spectabilis Hansen, 1902—Chile.
P. spinifer Hansen, 1902—Siam.

Polypauropus Remy, 1932.

P. duboscqi Remy, 1932 (type)—France, Greece.
P. duboscqi var. *inflatisetus* Remy, 1938—France.
P. legeri Remy, 1940—France.

Remypus Verhoeff, 1934.

R. sequanus (Remy, 1930). Verhoeff, 1934—France, Greece.
Allopauropus sequanus Remy, 1930 (type).

Samarangopus Verhoeff, 1934.

? *Austrolopauropus* (Bagnall, 1935). Remy, 1937.
S. jacobsoni (Silvestri, 1930). Verhoeff, 1934—Java.
Eurypauropus jacobsoni Silvestri, 1930 (type).

Scleropauropus Silvestri, 1902.

S. hastifer Silvestri, 1902 (type)—Italy.
S. grassei Remy, 1936a—France.
S. hanseni Bagnall, 1935—England.
S. lyrifer Remy, 1936—Germany.
S. portitor Remy, 1935—France.

Sphaeropauropus Silvestri, 1930.

S. malayus Silvestri, 1930—Java.

Stylopauropus Cook, 1896.

S. pedunculatus (Lubbock, 1866). Cook, 1896 (type)—Austria, Denmark, England, France, Germany, Italy, Jugoslavia, Russia.

S. pedunculatus var. *brevicornis* Remy, 1936—France.
S. pedunculatus var. *brito* Remy, 1938—France.
S. alaskensis Hilton, 1931a—Alaska.
S. atomus ? Cook, 1896—Long Island (U. S. A.).
S. dawsoni Hilton, 1931a—Yukon Territory.
S. digitis Hilton, 1930a—California.
S. globus Hilton, 1931a—Alaska.
S. locatus Hilton, 1930a—Oregon.
S. pubescens Hansen, 1902—France, Germany, Great Britain, Italy, Rumania.
S. simplus Hilton, 1930a—Lower California.

Thaumatopauropus Esaki, 1934.

T. glomerans Esaki, 1934 (type)—Japan.

Trachypauropus ? Tömösváry, 1882.

T. glomeriodes Tömösváry, 1882 (type)—Austria-Hungary, Italy.
Eurypauropus cycliger Latzel, 1884.
E. (Latzelipus) cycliger Verhoeff, 1934.
E. poecillifer Silvestri, 1902.

REFERENCES

Attems, C. G.
1895. Die Myriopoden Steirmarks. Sitzungsber. Akad. Wien. 104:117–238.
1930. Symphyla, Pauropoda, Diplopoda, and Chilopoda. Kukenthal's Handb. Zool. 4:1–402.
Bagnall, R. S.
1909. Notes on some Pauropoda from the counties of Northumberland and Durham. Trans. Hist. Soc. Newcastle 39:462–466.
1911. A synopsis of the British Pauropoda. Ibid. (N. S.) 3:654–660.
1914. Notes on Pauropoda with a brief description of a new species. Ibid. 4:59–60.
1918. Records of some new British diplopods and pauropods, with a preliminary check list of the British "Myriapods." Jour. Zool. Res. 3:87–93.
1935. An extended classification of the pauropods to include two new families. Ann. & Mag. Nat. Hist. 16: 619–629.
1935a. On *Thalassopauropus* Remy gen. et sp. no., an halophilous pauropod, and on the genus *Decapauropus* Remy. Scot. Nat. 79–82.
Cook, O. F.
1896. An enumeration of the Pauropoda. Brandtia 6:29–32.

Daday, E.
1889. Myriapoda Regni Hungariae. Budapest 1–126.
Esaki, Teiso
1934. Two new forms of the Pauropoda from Japan. Annot. Zool. Jap. 14:339–345.
Haase, E.
1885. Schlesiens Symphylen und Pauropoden. Zeitschr. Ent. 10:1–16.
Hansen, H. J.
1902. On the genra and species of the Order Pauropoda. Vidensk. Medd. (1902): 323–424.
Harrison, L.
1914. On some Pauropoda from New South Wales. Proc. Linn. Soc. 39:615–634.
Hilton, W. A.
1928. The occurrence of a member of the Class Pauropoda in California. Jour. Ent. Zool. 20:65.
1930. A member of the genus *Pauropus* from the Techachapi. Ibid. 22:153–154.
1930a. Pauropoda from North America. Ann. Ent. Soc. Amer. 23:765–782.
1930b. The distribution of Pauropoda. Sci. 71:69.
1931. Another record of a pauropod from Santa Cruz Island. Jour. Ent. Zool. 23:47.
1931a. Pauropoda from Alaska and the Yukon. Canad. Ent. 63:28–284.
1931b. Pauropoda in Alaska. Sci. 74:338.
1933. Pauropoda from New Mexico. Ann. Ent. Soc. Amer. Columbus. 26:554–556.
1934. A new species of Pauropus from Iowa. Ent. News. 45:67–68.
Kenyon, F. C.
1895. The morphology and classification of the Pauropoda, with notes on the morphology of the Diplopoda. Tufts College Studies. 4:76–146.
Kishida, K.
1928. A Japanese species of Pauropoda (*Neopauropus niwai*). Annot. Zool. Jap. 11:337–383.
Latzel, R.
1883. Die Pauropoden Oesterreichs: Ordnung Pauropoda Lubbock. Verh. Zool.-bot. Ges. Wien. 33:123–128.
1884. Die Myriopoden der Osterreichisch-Ungarischen Monarchie. 2te Halfte. Die Symphylen, Pauropoden und Diplopoden. Wien. 1–414.
Lubbock, J.
1866. On *Pauropus*, a new type of centipede. Trans. Linn. Soc. 26:181–190.

Packard, A. S., Jr.
1870. A remarkable myriapod. Amer. Nat. 4:621.
1870a. Sir John Lubbock's *Pauropus*. Ibid. 3:45.
Pocock, R. I.
1893. On the classification of the trachaete Arthropoda. Zool. Anz. 16:271–275.
Remy, P.
1930. Description d'un nouveau Pauropode de la fauna de France. Arch. Zool. exp. gen. 70:73–82.
1931. Un nouveau type de Pauropode: *Decapauropus cuenoti*, nov. gen., nov. spec. Arch. Zool. exp. gen. 71:67–82.
1932. Un Pauropode de Banyuls-sur-Mer type d'une famile nouvelle: *Polypauropus duboscqi* nov. gen., nov. spec. Ibid. 74:287–303.
1933. *Allopauropus barcinonensis* nou Pauropode de Catalunya. Mem. Acad. Barcelona. 23:271–274.
1933a. Un Pauropode nouveau d'Indochine: *Pauropus dawydoffi* n. sp. Faune Colon. Franc. 3:189–193.
1935. Pauropodes Francais. Vogesia. 1:2–4.
1935a. Diagnoses de Pauropodes nouveaux. Ibid. 1:6–8.
1935b. Myriapoda. I. Pauropoda. Mission Scientif. de l'Omo Paris. 2:185–191.
1935c. Pauropodes de Bourgogne. Bull. Sci. Bourgogne. 4:60–69.
1935d. Pauropodes du Museum National d'histoire naturelle (Collection H. W. Brolemann). Bull. Mus. Hist. Nat. Paris. (2) 7:209–216.
1935e. Quelques Pauropodes de France et des Balkans. Bull. Soc. Hist. Nat. Metz. (3) 34:271–294.
1936. Beitrag zur Fauna der Myriapoden Deutschlands, mit Beschreibung neuer Arten. Zool. Anz. Leipzig. 116:310–320.
1936a. Pauropodes du Museum National d'Histoire Naturelle II. Bull. Mus. Hist. Nat. Paris. 8:69–76.
1936b. Pauropodes du Museum National d'Histoire Naturelle III. Ibid. 8:132–137.
1936c. Pauropodes de France et des Balkans, avec description d'especes nouvelles. Arch. Zool. exp. gen. 78:13–31.
1937. Description de deux nouveaux Pauropodides. Bull. Mus. Hist. Nat. Paris. 9:309–312.
1937a. Die Eurypauropodidae (Myriapoda, Pauropoda) des Naturhistorischen Museums zu Wien. Verh. Zool.-bot. Ges. Wien. 86:5–34.
1937b. Les Eurypauropodinae du Museum National d'Histoire Naturalle. Bull. Mus. Hist. Nat. Paris. 9:252–257.

Remy, P.—(Continued).
1937c. Sur quelques Myriapodes de l'Europe boreale. Ann Ent. Fennici. 3:140–145.
1938. Pauropodes de France, d'Allemagne, et des Balkans avec description de quatre formes nouvelez. Bull. Soc. Hist. Nat. Metz. 35:153–178.
1940. Contribution a la faune des Myriapodes de corse. Bull. Soc. Zool. France. 65:45–57.
Ryder, J. A.
1879. An account of a new genus of minute pauropod myriapods. Amer. Nat. 13:603–612.
1879a. Notice of a new pauropod. Proc. Acad. Nat. Sci. Phila. (1879):139.
1879b. Larva of *Eurypauropus spinosus*. Ibid. (1879):164.
Schmidt, P.
1895. Beitrage zur Kenntnis der niederen Myriopoden. Ziet. wiss. Zool. 59:436–510.
Silvestri, F.
1895. Contribuzione alla conoscenza dei Chilopodi, Symphyli, Pauropodi, e Diplopodi del Umbria e del Lazio. Boll. Soc. Rom. Zool. 3:191–201.
1902. Acari, Myriapoda et scorpions hucusque in Italia reperta. Ordo Pauropoda. Portici. viii—85.
1930. Descrizione di due nuovi Pauropode (Myriapoda) di Giava. Bull. Lab. Zool. Portici. 23:227-231.
Snodgrass, R. E.
1938. Evolution of the Annelids, Onychophora, and Arthropoda. Smithson. Misc. Coll. 97:1–159.
Tömösváry, E.
1884. A heterognathak egy uj alakja Hazankban. 'Eine neue Art der Heterognathen. Term. fuzetek. 7:39–40.
Verhoeff, K. W.
1934. Bronn's Klassen und Ordnungen des Tier-Reichs. Symphyla und Pauropoda. Leipzig. 1–200.
Williams, W. R. and R. A. Hefner.
1928. The millipedes and centipedes of Ohio. Ohio Biol. Sur. Bull. 18:93–147.